

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application for LETTERS PATENT

for

SYSTEM AND METHOD FOR  
COLLABORATIVE ACTION

by

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## **SYSTEM AND METHOD FOR COLLABORATIVE ACTION**

### **FIELD OF THE INVENTION**

The present invention relates to a system and method for collaboration,  
5 and more particularly, to a system and method to allow two or more parties to  
efficiently collaborate on one or more projects.

### **BACKGROUND OF THE INVENTION**

Traditionally, parties separated by distance have collaborated via long telephone  
10 conferences or random exchanges of E-mail. Through these communications, work  
issues are addressed and actions were assigned haphazardly and inefficiently. In many  
cases one party fails to take action because they erroneously believe they are waiting  
for another party to complete an action. The sharing of data with many individuals in  
paper format, like action items, evaluations, charts, etc., allows information to be easily  
15 lost.

Information about the project is typically retained by many independent systems  
incapable of intercommunication. This forces each party to update information  
received from another party, imparting an inherent inefficiency. Unfortunately,  
traditional methods of collaboration are paper intensive, time and labor intensive, and  
20 inherently inefficient. Accordingly, there is a need in the art for a more efficient  
method of inter party collaboration.

## BRIEF SUMMARY OF THE INVENTION

In one aspect, the present invention relates to a method of reducing the overall time required for more than one party to collaboratively perform a number of tasks, where each task requires a series of collaborative actions, said method comprising the

5 steps of recording the series of collaborative actions into a script of database; and displaying a status of the actions taken in each of the tasks, wherein the status of each task may be simultaneously viewed, and wherein each party may view the status of each task.

## BRIEF DESCRIPTION OF THE OF THE DRAWINGS

10 These and other features and advantages of the invention will now be described with reference to drawings of certain preferred embodiments, which are intended to illustrate and not to limit the present invention:

**Fig. 1** is a high-level drawing illustrating the primary components of a collaborative system of a first embodiment of the present invention;

15 **Fig. 2** illustrates a display of the collaborative system according to the first embodiment of the present system;

**Fig. 3** illustrates a sequence of steps that are performed by the collaborative system according to the first embodiment of the present invention;

**Fig. 4** illustrates a display of a collaborative system according to a second

20 embodiment of the present invention;

**Fig. 5** illustrates a sequence of steps performed for reporting and updating the collaborative system according to the second embodiment of the present invention;

**Fig. 6** is a high-level architectural drawing illustrating the primary components of a collaborative system of a third embodiment of the present invention;

5        **Fig. 7** illustrates a sequence of steps in a main application performed by a processor to allow inter party corroboration according to the third embodiment of the present invention;

**Fig. 8** is a screen display of a task list according to the third embodiment of the present invention;

10       **Fig. 9** illustrates a sequence of steps performed by a subroutine of the main application to develop a task script;

**Fig. 10** is a screen display of a task script input screen;

**Fig. 11** is a screen display of a task script input screen for inputting actions;

**Fig. 12** is a screen display of a task script editing screen;

15       **Fig. 13** is a screen display of a task script according to the third embodiment of the present invention;

**Fig. 14** illustrates a sequence of steps performed by a subroutine of the main application to update a status report;

**Fig. 15** is a screen display of a task status report;

20       **Fig. 16** illustrates a sequence of steps performed by a subroutine of the main application to notify parties of new issues;

**Fig. 17** is a screen display of a new issue input screen;

**Fig. 18** is a screen display of an issue report screen;

**Fig. 19** is a screen display of a task schedule;

**Fig. 20** is a high-level architectural drawing illustrating the primary and

5 optional components for implementing a corroborative testing web site according to a fourth embodiment of the present invention;

**Fig. 21** is a flow diagram illustrating information received and provided by a user of the test web site;

**Fig. 22** is a screen display personalized for a user of the Test Web Site;

10 **Fig. 23** is a flow diagram illustrating the interaction of the user and a test script of one for the embodiment of the present invention;

**Fig. 24** is a flow diagram illustrating the interaction of the user test status report of the present invention;

15 **Fig. 25** is a screen display of a test status report of the fourth embodiment of the present invention;

**Fig. 26** is a screen display for inputting test results;

**Fig. 27** is a flow diagram illustrating the interaction of the user and the test web site when addressing process issues;

## DETAILED DESCRIPTION OF THE INVENTION

**Fig. 1** illustrates the most general structure of a collaborative system **5** that operates in accordance with the present invention. The system includes multiple parties **10**, a focal **12**, a communication system **14**, and a display **16**. The multiple parties **10** and focal **12** may be individuals, devices, institutions, or other organized entities. The communication system may be interpersonal, physical, or electronic in nature.

The physical or electronic display **16**, as shown in **Fig. 2**, includes a task form **18**, an exemplary script **20** for a first task, and a status table **22**. Each portion of the display is preferably viewable on demand. The collaborative system **5** increases the speed and visibility of collaborative tasks by having the focal **12** post and constantly update the status of each task at the display **16**. By increasing speed and visibility, working relationships between the parties are enhanced and task costs are reduced.

**Fig. 3** illustrates the steps of a process **24** implemented by the system **5** of the present invention. Initially, in step **26**, a total number of tasks to be collaboratively performed by the collaborating parties, are recorded on the task table **18**. Next, in step **28**, each step for each action required to perform one of the tasks is recorded in a script, such as the script **20**, where each task is assigned its own script. In each script **20**, for each of the tasks, a party is assigned one or more steps to perform within the script **20**, in step **30**. Next, in step **32**, each party **10** reports to the focal **12** when it has completed a step in one of the scripts **20**. This updating step is performed for each

task. In step **34**, the focal **12** updates the status table **22** to indicate the last action completed for each task, and whether the task has been started, is in work, or has been completed. Finally, the focal **12** in step **36** ends the updates when all tasks have been completed.

5           In a second embodiment, the system **5** enhances the display **16** to include a list of process issues **38**, and a test schedule **40**, as shown in **Fig. 4**. The list of process issues **38** includes issues such as problems, shortages, etc., which may be interfering with the completion of an action for a particular task. The issues are posted so that each party, including the focal **12**, has the opportunity to evaluate the issue and propose  
10   a resolution. A sequence of reporting steps for reporting issues, as shown in **Fig. 5A**, includes step **42** of each party **10** reporting to the focal **12** any issues that occur during a step in one of the scripts **20**. An appropriate member of the parties **10** comments on a proposed or implemented resolution to the issue in step **44**. Step **44** is repeated until the issue is resolved. The reporting step, as shown in **Fig. 5B**, includes a step **36** of the  
15   focal **12** updating the issues list to include new issues.

As shown in **Fig. 4**, the display **16** preferably includes the steps or actions for each task. Here an exemplary script **20** for the first task includes a series of sequential steps associated for each sequential action to be performed in the task, an assignment of an individual, group, machine, or combination thereof of one of the parties **10** to  
20   perform each of the actions, an assigned date each action is scheduled to be performed, and the location where the action will take place.

The status form **22** of the display **16**, as shown in **Fig. 4**, preferably includes indicating two or more tasks and whether a part of one of the tasks has not been started, is in work, failed, or has been completed. The status form **22** also includes the last action completed, the total number of actions in each of the tasks, and the percentage of  
5 number of actions completed for each of the tasks.

**Fig. 6** illustrates the general architecture of a third embodiment of a collaborative computer system **50** according to the present invention. The computing system **50** includes a computer **52** operated by each of the collaborating parties, a collaborative web site **54**, having a web server application **56** for communicating with  
10 each party's computer **52** over the Internet, and a collaborative application **58** which provides access to the site's various databases, each application being run by a CPU (not shown). The databases include a task database **60**, including the title of each task to be performed by the parties, and a script database **62**, which includes all the actions required to perform each one of the tasks. The databases also include a status  
15 database **64**, which includes the status of each task and the last action completed, and a schedule database **66**, including the scheduled time allotted for each task and the percent of the task completed. The databases further include an issue database **68** which includes the issues encountered by the parties, as well as potential or implemented resolutions. The aforementioned databases may be a plurality of tables  
20 within a single database.



**Fig. 7** shows a main application and process **70** implemented by the collaborative application **58** of the web site **54**. Initially, a processor in implementing the application **58**, in step **72**, requires entry of all tasks, identified by a script number, and an associated title into the task database **60**. Each user via their computer **52** may  
5 view the task database **60** at the corroborative web site **54** in a format as shown in **Fig. 8**.

In step **74**, the application **58** invokes a script subroutine, as shown in **Fig. 9**. The script subroutine enters new scripts and edits prior scripts on the script database **62**; if no script is added or edited, then step **300** returns to the main  
10 application **70**. However, if a new script has been added, then the application **58** proceeds to step **301** and selects a task. A party user adding a test script will be provided a form by the web site **54** as shown in **Fig. 10**. Each new task has a script title and script number, added in step **302**, as well as a schedule for performance. In step **304**, the application **58** assigns each action a sequential step.

15 The web site **54** provides a form for inputting a detailed action description, as shown in **Fig. 11**. In step **306-310**, the application **58** inputs an action and associates a party to perform the action, a location of performance and preferred date of performance. The application **58**, in step **312**, ensures all actions/steps have been entered, and step **314** checks for additional new or edited tasks. A user party is  
20 provided a form, shown in **Fig. 12**, to assist in editing a script action. In step **316** the application stores all inputted script data to the script database **62**.

A party via their computer **52** may recall a script of a particular task from the script database **62**. Preferably, the script will be displayed as shown in **Fig. 13**. Here, the range of days for steps to be completed is shown in the “day” field; each step number is displayed and associated with an action. The “job role” field indicates which collaborating party will be performing the action, and the “site” field is the proposed location the action is to occur.

When all scripts have been added or edited, the application **58** invokes the update task subroutine **78**, as shown in **Fig. 14**. In step **320**, the application **58** checks for new updates on actions. If none have occurred, then it returns to the main application **70**. If an update has been received, then the application **58** proceeds to step **322**, inputting the last action attempted, whether it was successful or failed, the last action completed, and the associated task prompting for the task’s script number. In steps **324-334**, the application **58** compares the last action completed with the total number of actions in the task. If no action has been taken, then a “not started” status is stored in the status database **64**. If the last action completed has the final action of the task, then a “complete” is stored in the status database. If neither occurred, then the application will store an “in work” in the status database, as well as calculate and store the percentage of actions completed, in the task. The percentage complete is then updated in the schedule database **66**. The application **58** continues to enter new updates until all updates have been stored in the status database **64**.

A party user may instantly view the status of each task on the web site **54**.

Preferably, the party user will be provided status screen information in the format shown in **Fig. 15**. A script number identifies each task being collaborated on by the parties; the title also identifies the task. The “Last Pass/Failstep” field indicates the last action attempted in the task and whether it was successfully completed (i.e., pass) or not completed successfully (i.e., fail). A hyperlink on the “get” button will allow the party user to see if the last step failed. The “get” button goes to the screen where the user can enter/edit test results. The “status field” indicates at a glance whether the script was completed, not started, failed, or in work. The total number of steps/actions and the percentage of steps/actions completed are also displayed on field. Use of the status screen provided by the web site **54** allows multiple partners to immediately see which tasks need to be completed, and whether they may begin the next action in a task after the previous action/step has been successfully completed by another party, including an individual, an organization, or device. This significantly increases the speed and efficiency of any collaborative action.

Once the application **58** has updated the status database **64**, it invokes the issues subroutine **78**, as shown in **Fig. 16**. The application **58**, in step **350**, checks for open issues; if there are none, it returns to the new application **70**. The web site **54** provides a form, shown in **Fig. 17**, for submitting new issues. The new issues are typically related to problems encountered during the performance of an action/step in a particular task. In step **352**, the new issue is stored in the issue database **64**. In step **354**, the

application **58** associates the issue with a step of a script for a particular task; and in step **356**, the application preferably awaits and inputs a suggested or implemented resolution to the issue. The web site **54** provides an informational screen, shown in **Fig. 18**, indicating the status and description of all issues encountered during the collaboration effort of the parties. Once all new issues have been input, the issues subroutine **78** returns to the main application **70**.

The application **58** proceeding to step **80** updates the schedule. As shown in **Fig. 19**, the schedule includes a task description, and the proposed dates the task will be “in work” as denoted by a bar graph. Each bar of the bar graph is shaded by being manually updated or preferably by being dynamically updated by the status database to indicate the percentage of actions completed as the percentage of the bar shaded. When all collaborative tasks have been successfully completed or abandoned, the application **70** ends.

**Fig. 20** illustrates the general architecture of a fourth embodiment of a collaborative computer system **400** between a service provider and a partner. The service being provided by the service provider includes one of information, general services, communication, or interaction of computing systems. In this embodiment, the computer system **400** assists in a collaborative testing of the connectivity, interaction, and ability to retrieve information between computing systems.

The testing computer system **400** includes a firewall **402**, which uses a reverse proxy. The system **400** only communicates with a desirable party **404** via SSL

encryption. The partner is authenticated via an Authentication Database **406** and then permitted access to a Test Web Site **408** using a database **410**, which is accessible to a provider user **412**.

The Test Web Site **408** allows a user to select a test script, test status, to submit  
5 an issue, view all issues, view proposed issues, view open issues, view pending issues, view closed issues, test schedule, telecon schedule, and contacts.

The provider may be involved in numerous collaborative testing efforts, and the Test Web Site **408** allows the provider user **412** to select a particular company as the current partner. The list of partners is in a drop-down box shown in **Table 1**.

10

DAISST	
List of Partners	Partner Code
A	01
B	02
C	03
D	04
E	05
F	06
G	07
H	08

**Table 1.** List of Partners

Users that access and use the Test Web Site **408** preferably have a browser that supports cookies, and the browser should be configured to accept cookies. The Test  
15 Web Site **408** is structured so one partner will not have the ability to view other partner's data (i.e. test scripts, test status, issues, etc.). Any data that is partner unique,

and not located in the database **410**, shall be stored in a separate directory on the Test Web Site **408**.

The partner user is preferably authenticated, via a user ID and password, as depicted in the system flow diagram shown in **Fig. 21**.

5           The Test Web Site **408** shall check the user ID. If the user ID is in the Authentication Database **406**, then the user shall be allowed to gain access to the Test Web Site. If the user ID is not in the Authentication Database **406**, then the user shall not be allowed to gain access to the Test Web Site **408**.

10           The Test Web Site **408** shall check the ID. If the proper ID is received by the Authentication Database **406**, then the user shall be allowed to gain access to the Test Web Site **408** and a personalized Test Web Site's Home Page shall be displayed, as shown in **Fig. 22**. If the ID is not in the Authentication Database **406**, then the user shall not be allowed to gain access to the Test Web Site **408**, and a message indicating that the incorrect user ID and/or password was entered shall be displayed to the user.

15           In this embodiment, as shown in **Fig. 23**, the Test Web Site **408** displays the script number and title of each test script associated with a unique partner. The Test Web Site **408** provides the capability to view each test step within each test script, where each test step includes: Day; Step Number; Job Role; Site (Provider or Partner); and Action. The Day column displays the anticipated day in which this test step is to  
20           be executed, the Step Number column displays the test step number, and the Job Role column displays either the Provider or Partner.

The Site column displays the location of the action of either Provider or Partner, depending on if this step is a Provider action or a Partner action. The Action column displays the contents of the specific action that the step requires.

In this embodiment, as shown in **Fig. 24**, the Test Web Site **408** provides the capability to view overall test status. The test status has the following groupings: Total Tests; Tests Not Started; In-Work; Tests Failed; and Completed Tests.

The Total Tests field includes the total number of test scripts that have been entered into the database for a given partner. The Tests Not Started field includes the total number of test scripts that do not have any test step with a pass or fail status. The In-Work status field includes the total number of test scripts that have at least one test step passed, excluding the last step. The Tests Failed field includes the total number of test scripts that have at least one test step failed. The Completed Tests field includes the total number of test scripts that have the last step passed, with no failed steps.

The Test Web Site, as shown in **Fig. 25**, provides the capability to view the detailed test status of an individual test script. The detailed test status has the following groupings: Test Number; Test Title; Last Step Pass/Fail; Test Status; Total Number of Steps; and Percent Complete. The Test Number column is the number assigned to the test script, the Test Title column is the title given to the test script, and the Last Step Pass/Fail column is the last test step number that has passed or failed. The user is displayed a drop down list of all test step numbers, in ascending order. The default test step number in the drop down list is the last test step that has passed or failed. The Test

Status column displays the current test status of each test script, as discussed above.

The Total Number of Steps column displays the total number to test steps for the test script. Finally, the Percent Complete column displays the percent of completed test steps for the test script (i.e. the number of completed test steps divided by the total

5 number of test steps, represented in a whole number).

The Test Web Site, as shown in **Fig. 26**, provides the capability to enter test results of an individual test step. The test results are viewable by selecting the appropriate test step from the view detailed test status screen and selecting “get,” as discussed above. The enter test results screen has the following groupings: Pass/Fail;  
10 Results; Remarks; and all of the specific test step information.

The Pass/Fail column comprises a drop-down box containing the following three values: “blank”; Pass; and Fail. The user will be able to select only one of these selections. The Results column allows the user to enter any text he/she wishes, and the Remarks column allows the user to enter any text he/she wishes.

15 Once the user selects the “submit” button, the Pass/Fail, Results, and Remarks information is entered into the database. The user ID of the user doing this action and the date/time of this action is saved in the database. A provider or a partner user will be able to enter test results into any specific step. Once the user selects the “clear” button, the data entered into the Pass/Fail, Results, and Remarks fields is reset to the  
20 previous values.



As shown in **Fig. 27**, the Test Web Site **408** provides the capability to submit a new issue. The submit a new issue screen has the following fields: Title; Description; Problem Category; Problem Sub-Category; Test Phase; and Test Script. The Title field is a required entry field in which the user enters the title of the issue. The Description field is a required entry field in which the user enters a description of the issue. The Problem Category field consists of a drop-down list of the values listed in **Table 2**.

Problem Categories
TBD

**Table 2.** List of Problem Categories

The Problem Sub-Category field consists of a drop-down list of the values listed in **Table 3**.

Problem Sub-Categories
TBD

**Table 3.** List of Problem Sub-Categories

The Test Phase field consists of a drop-down list of the values listed in **Table 4**.

Test Phases
DAISST
End-to-End

**Table 4.** List of Test Phases

5

The Test Script field shall consists of a drop-down list of the titles of the Test Scripts, as listed in **Table 5**.

List of Test Script Titles - DAISST
FTU616SCML-01 Process Initial Supplier Custom Module List
FTU616SCML-02 Process Revised Supplier Custom Module List
FTU616SCML-03 Process Supplier Custom Module List with SCP Removed
FTU616SMPL-01 Process Initial Supplier Module Parts List for Module
FTU616SMPL-02 Process Revised Supplier Module Parts List for Module
FTU616SMPL-03 Process Supplier Module Parts List for Exception Module
FTU616SMPL-04 Process Supplier Module Parts List when using Picture Sheet Controlled Components or Installation Features
FTU616SMPL-05 Process Supplier Module Parts List for Module at Developmental Phase

**Table 5.** List of Test Script Titles

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Once the user selects a “submit” button, the above entered/selected information shall be entered into the database 410, along with the user ID, and date/time. The Test Web Site assigns the submitted issue an issue number and display that number to the user.

- 5           The Test Web Site sends an email to a pre-determined list of provider employees, indicating a new issue has been submitted. Refer to **Table 6** for a list of people receiving a “new issue” email. It is envisioned that the people that receive this email are the appropriate people that need to start the issue resolution process. Another external source, outside of the Test Web Site, will be used to document issue resolution
- 10   progress.

People Receiving “New Issue” Email - DAISST	
Name	Email Address
Cindy	‘cindy@boeing.com’
Nancy	‘nancy@boeing.com’
Cole	‘w.c.@boeing.com’
TBD	

**Table 6.** List of People Receiving New Issue Email

- 15           If the issue was submitted by a partner, the email body includes a statement that indicates which partner company submitted the issue, the name of the individual who submitted the issue, the issue number, and the issue title.

If the issue was submitted by a provider user, the email body includes a statement that states that the issue was submitted on behalf of a partner, the name of the partner, the name of the individual who submitted the issue, the issue number, and the issue title.

5           The Test Web Site provides the capability to view issue reports. The user requests the following issue reports: View All Issues; View Proposed Issues; View Open Issues; View Closed Issues; and View an Individual Issue.

10           Upon selection of the View All Issues “Go” button, the Test Web Site **408** provides a list of all issues that that partner has in the database. Viewing all issues shall retrieve all issues, whether the issue has the issue indicator set as Yes or No

          Upon selection of a View Proposed Issues “Go” button, the Test Web Site provides a list of all temporary issues that that partner has in the database. Viewing proposed issues shall retrieve only those issues that have the issue indicator set as No.

15           Upon selection of the View Open Issues “Go” button, the Test Web Site **408** provides a list of all open issues that the partner has in the database. Viewing open issues shall retrieve only those issues that have the issue indicator set as Yes, and there is no Closed Date, and there is no Pending Date.

20           Upon selection of the View Pending Issues “Go” button, the Test Web Site provides a list of all pending issues that that partner has in the database. Viewing pending issues shall retrieve only those issues that have the issue indicator set as Yes, and there is no Closed Date, and there is a Pending Date.

Upon selection of the View Closed Issues “Go” button, the Test Web Site **408** provides a list of all closed issues that that partner has in the database. Viewing closed issues shall retrieve only those issues that have a Closed Date.

The Test Web Site provides the capability for the user to enter an individual  
5 issue number and retrieve the latest status of that issue.

The partner will be able to view the following fields of information upon selection of one of the issue reports discussed above: Number; Title; Description; Start Date; Assign Date; Due Date; Pending Date; Slip Date; Closed Date; and Status.

The Number field contains the issue number, the Title field contains the title of  
10 the issue, and the Description field contains the description of the issue.

The Start Date field contains the date that the issue was received by the provider. This field is machine generated. The Assign Date field contains the date that a provider user first looked at the issue. The Due Date field originally contains a date that is ten days into the future from the Start Date. This field is originally machine  
15 generated, but can be manually updated via an external source to the database. The Pending Date field contains the estimated date of partner resolution. The Slip Date field contains a new Pending Date, if there is one. The Closed Date field contains a date that the partner and provider concur that the issue has been resolved. The Status field contains textual information that summarizes the progress of this issue’s  
20 resolution. This field is manually entered via an external source to the database.

An Action Item Description field contains a description of an action item that was assigned pertaining to the resolution of the issue. There could be many action items that are assigned to resolve a particular issue. The Action Item Deliverable field contains a description of a deliverable(s) that are being used to resolve the issue. This field is manually entered via an external source to the database. The Action Item Due Date field contains a date when the action item is/was due. The Action Item Status field contains an indication of whether the action item is open or closed.

As shown in **Fig. 21**, the Test Web Site provides the capability to view Test Plans. Further, as shown in **Fig. 21**, the Test Web Site provides the capability to view Test Schedules. The Test Schedules are specific to a given partner. The Test Web Site stores the Test Schedules in a directory specific to a partner. Upon selection of "Test Schedule," the Test Web Site checks which partner this user represents, and then displays the Test Schedule associated with this partner.

This embodiment allows a single source of testing data, interactive testing progress, reactive test status, integrated issues process, which increase efficiency and reduce cost for this collaborative effort.

While the detailed description above has been expressed in terms of specific examples, those skilled in the art will appreciate that many other configurations could be used. Accordingly, it will be appreciated that various equivalent modifications of the above-described embodiments may be made without departing from the spirit and scope of the invention.